WHAT IS CLAIMED IS:

1.   A method for modeling a system design comprising the steps of:

defining at least one cell that describes a device within the system;

defining one or more instances of said at least one cell, wherein the instances describe devices that are used to form the functionality of the cell; and

defining occurrence nodes for each of said one or more instances, wherein said occurrence nodes are arranged in one or more hierarchical levels.

2.   The method of claim 1 wherein each occurrence node comprises specific occurrence data for that occurrence node.

3.   The method of claim 1 wherein each occurrence node comprises pointer information that indicates a specific occurrence node in a previous level.

4.   The method of claim 3 wherein said pointer information operates as a search key that allows O(log N) search performance.

5.   The method of claim 3 further comprising:

searching said occurrence nodes using said pointer information.

6.   The method of claim 3 wherein said pointer information for a top level occurrence node is a null pointer.

7.   The method of claim 1 wherein each occurrence node comprises describer pointer information that points to information that is common to a plurality of the occurrence nodes.

8.   The method of claim 1 further comprising the steps of:

defining occurrence specific data for each occurrence node;

defining an owner pointer for each occurrence node, wherein the owner pointer indicates a specific occurrence node in a previous level;

5   defining a describer pointer for each occurrence node, wherein said describer pointer points to an instance that is used to describe the occurrence node.

9.   The method of claim 1 further comprising the step of:

defining net occurrences for each of said occurrence nodes.

10.   The method of claim 1 wherein users define a portion of the system by defining a number of cells, instances and occurrence nodes that are less than the total number of cells, instances and occurrence nodes.

11.   A method for defining and analyzing a system that is defined by a folded model comprising cells and instances, the method comprising the steps of:

defining occurrence nodes for said folded model, wherein said occurrence nodes are arranged in hierarchical levels; and

5   specifying a pointer for each of said occurrence nodes, wherein the pointer points to a specific occurrence node in another level.

12.   The method of claim 11 further comprising:

assigning a top level occurrence node a null pointer to indicate it is the top level node.

13.   The method of claim 11 wherein said pointer allows users to search both up and down the hierarchical levels with a O(log N) performance.

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14.   The method of claim 13 further comprising the step of:

searching said occurrence nodes using the pointer as a search key.

15.   The method of claim 14 wherein the searching step further comprises:

searching with a map container of a Standard Template Library.

16.   A method for providing occurrence nodes for a lightweight folded model comprising the steps of:

specifying data that is specific to each of said occurrence nodes;

specifying owner pointers for each of said occurrence nodes, wherein said owner pointers point to a occurrence node in a different level in a hierarchy of levels; and

specifying describer pointers for each of said occurrence nodes, wherein said describer pointers point to information that is common to a plurality of occurrence nodes.

17.   The method of claim 16 further comprising:

specifying only a portion of the total number of occurrence nodes that are required to define an entire system.

18.   The method of claim 17 wherein the specified portion of occurrence nodes are those occurrence nodes that are required to analyze a selected part of the system.

19.   The method of claim 16 further comprising the step of:

storing the specified data and pointers in the folded model.

20.   The method of claim 16 wherein said owner pointer can be searched to identify specific occurrence nodes both up and down in the hierarchy of levels.

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